IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA

CHARLESTON DIVISION

CSX TRANSPORTATION, INC.,

Plaintiff,

v. CIVIL ACTION NO. 2:01-0299

THE BOARD OF PUBLIC WORKS OF
THE STATE OF WEST VIRGINIA, et al.,

Defendants.

OPINION

This matter came for trial before the court sitting without a jury on October 6, 2003. Following the presentation of evidence by the parties, the court took this matter under advisement and ordered the parties to submit post-trial briefs and an agreed statement of fact. The parties have complied and this matter is now ripe for adjudication. For the reasons stated below, the court **FINDS** that the sales ratio for other commercial and industrial property in West Virginia for the tax year 2000 is 56.1% and **ORDERS** the Board of Public Works to assess taxes against CSX Transportation, Inc. accordingly.

I. Background

"In 1976, after 15 years of intermittent and inconclusive legislative action, Congress passed the Railroad Revitalization and Regulatory Reform Act, Pub.L. 94-210, 90 Stat. 31 (Act). The Act's purpose, as stated in the congressional declaration of policy, was 'to provide the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the

financial stability of the railway system of the United States.'" *Burlington N. R.R. Co. v. Okla. Tax Comm'n*, 481 U.S. 454, 457 (1987) (citation omitted). Section 306 of the Act, codified at 49 U.S.C. § 11501 (2002), prohibits states from taxing rail transportation property in a discriminatory manner.

The plaintiff in this action, CSX Transportation, Inc. (CSXT), is a railroad company owning property in West Virginia. The defendant, Board of Public Works of the State of West Virginia (the Board), is the governmental body responsible for assessing taxes on CSXT's property. CSXT alleges that the Board's property tax assessment of its property for the tax year 2000 is discriminatory as defined by Section 306.[1] Section 306 states in pertinent part:

> (b) The following acts unreasonably burden and discriminate against interstate commerce, and a State . . . may not do any of them:
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> > (1) Assess rail transportation property at a value that has a higher ratio to the true market value of the rail transportation property than the ratio that the assessed value of other commercial and industrial property in the same assessment jurisdiction has to the true market value of the other commercial and industrial property . . . .
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> (c) . . . Relief may be granted under this subsection only if the ratio of assessed value to true market value of rail transportation property exceeds by at least 5 percent the ratio of assessed value to true market value of other commercial and industrial property in the same assessment jurisdiction . . .

49 U.S.C. § 11501.

Under this provision, the taxation of rail transportation property is discriminatory if the ratio of assessed value to market value for rail transportation property exceeds the ratio of assessed value to market value for other commercial and industrial property in the same taxing jurisdiction. *Id.* To obtain relief for discrimination of this nature, the ratio for rail transportation property must exceed

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[1] The parties have stipulated that the court's decision as to the tax year 2000 case will control the outcome of the tax year 2001 case. Tr. Vol. I, pp. 4-5.

the ratio for commercial and industrial property by at least 5%.[2] *Id.*

West Virginia law requires all non-exempt property to be appraised at its "true and actual value"[3] and to be assessed at 60% of its appraised value. W. Va. Const. Article X, § 1b(A); W. Va. Code § 11-3-1 (2003). Actual assessments in West Virginia differ from this required 60/100 ratio due to "variations in the assessment process and fluctuations in market values." *CSX Transp. Inc. v. Bd. of Public Works*, 95 F.3d 318, 324 (4th Cir. 1996) (*CSXT II*). In the present case, the parties have stipulated that the ratio of assessed value to true market value of CSXT's railroad property in West Virginia for the tax year 2000 is 60/100, meaning the assessed value is 60% of the property's true market value. Tr. Vol. I, pp. 7. The dispute concerns the ratio of assessed value to true market value for other commercial and industrial property in West Virginia. While the parties agree that other commercial and industrial property was assessed at less than 57% of its true market value (and thus that the Board has discriminatorily taxed CSXT under the provisions of Section 306), each party's expert has arrived at a different estimate of this assessment.

(A) Standard of Review

This case does not involve a review of an assessment by a state agency or other comparable body such as would require the court to apply a deferential standard of proof. *See CSXT II*, 95 F.3d

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[2] The requirement that the difference be greater than 5% refers to 5% of the ratio, not to 5% of the properties true and actual value. The parties have stipulated that CSXT's property in West Virginia is assessed at 60% of market value and agree that CSXT is entitled to relief if other commercial and industrial property in the state of West Virginia is assessed at less than 57% of market value. Tr. Vol. I, pp. 8.

[3] The term "true and actual value of property" means the price for which the property would sell in an arm's length transaction between a willing buyer and a willing seller. True and actual value is equivalent to the term "true market value" used in Section 306.

at 323. Rather, this case is an original action brought in federal court for the purpose of determining the extent to which West Virginia has discriminatorily taxed CSXT. The parties have stipulated to a database of sold commercial and industrial properties, and both parties' experts used this database to fix the level of assessment for commercial and industrial property. Tr. Vol. I, at 13. The role of the court is to decide which, if either, of the statistical methods of analysis used by the experts correctly fixes the ratio of assessed value to true market value for commercial and industrial property. *See id.* Should the parties fail to prove ratio of assessed value to true market value to the satisfaction of the court using the sales ratio test, Section 306 provides other means of determining discrimination. 49 U.S.C. 11501(c).

"The burden of proof in determining assessed value and true market value is governed by State law." *Id.* In *CSXT II*, the Fourth Circuit found that when a taxpayer makes an initial challenge to an assessment of his property, West Virginia courts require the taxpayer to prove his case by a preponderance of the evidence. *See CSXT II*, 95 F.3d at 323. Accordingly, a taxpayer who alleges discrimination under Section 306 is held to the same standard. *See id.* The posture of this case differs slightly from *CSXT II* because the Board has conceded that its assessment is discriminatory under Section 306. Nevertheless, the focus of the court's inquiry in the present case is exactly the same as in *CSXT II*. As in *CSXT II*, the court must choose between statistical methods of analysis offered by each party's expert. The parties agreed at oral argument that the burden of proof does *not* shift to the Board merely because Board's expert proposes a ratio of assessed to true market value that proves the state has discriminated against CSXT under Section 306. Tr. Vol. I, pp. 33. Therefore, to prevail CSXT must prove its case by a preponderance of the evidence.

(B) Determining Sales Ratio for Commercial and Industrial Property

Congress has indicated that the ratio of assessed value to true market value of other commercial and industrial property should be determined through the "random-sampling method known as a sales assessment ratio study . . . ." 49 U.S.C. § 11501(c). In a sales assessment ratio study, a ratio is determined for each property sold during the tax year based on the property's true market value as compared to its assessed value. The median ratio of all the sold properties in the study is then used to represent the ratio of assessed value to true market value for all the properties in the taxing jurisdiction. *See CSXT II*, 95 F.3d at 324. A sales assessment ratio study uses sold properties as a sample group representing all properties precisely because the true market value of sold properties is known, whereas the market value for unsold properties cannot be determined. In the present case, the sales ratio study is based upon sold commercial and industrial property in West Virginia.[4]

Because a sales ratio study determines the ratio of assessed value to true market value by using a sample of sold properties to represent unsold properties, the accuracy of a sales ratio study hinges upon whether sold and unsold properties are similarly assessed. The parties agree that West Virginia's sales ratio study of commercial and industrial property has been distorted by "sales chasing," and that to be accurate, the sales ratio study must be corrected to account for this distortion.

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[4] All sales occurring during a tax year enter the database for the sales ratio study, but some sales are later excluded from the study because county assessors code the sales invalid, meaning that the sales are not valid arm's length transactions. Tr. Vol. I, pp. 45-46. Note 8 *infra*. Initially, the parties disputed whether the assessors' coding choices affected the statistical reliability of the sales assessment ratio study. Docket 76 - Plaintiff CSX Transportation, Inc.'s Pre-Trial Memorandum of Law at 5. By stipulating to a database of sales, however, the parties made this issue moot as to tax years 2000 and 2001. Tr. Vol. I, pp. 5.

"Sales chasing" is a term of art that refers to the practice of changing a sold property's assessment, without similarly changing the assessments of unsold properties.[5] To correct for the distortion caused by sales chasing, some sold properties' assessments must be reverted to the prior year's assessment, and the median sales ratio must be re-calculated using the post-reversion figures. Each party has reverted about the same number of assessments and then re-calculated the sales ratio for the commercial and industrial property. The sales ratios determined by the experts as a result of this recalculation differ, however, because the experts used different methods of selecting properties for reversion.

(C) CSXT's Statistical Methodology

The plaintiff's expert, Dr. Larry E. Richards, obtained a copy of the 2000 commercial and industrial tax role for West Virginia, prepared his own sales ratio study using a stratified estimator,[6] and then adjusted his study to the database agreed upon by the parties. Tr. Vol. I. pp. 53, 61. In preparing his sales ratio study, Dr. Richards used a Chi-square test to determine whether West Virginia assessors had chased sales during the tax year 2000. Tr. Vol. I, pp. 70. Chi-square is a

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[5] West Virginia law requires that property be assessed annually as of July 1st. W. Va. Code § 11-3-1. This means that the value of property for assessment purposes is determined according to the value of the property on July 1st. Tr. Vol. I, pp. 50-51. Assessors, however, have until January of the following year to enter their assessments on the rolls. *Id.* Due to the practical impossibility of determining a property's value as of July 1st prior to that date, assessors enter their assessments in the latter half of every year. *Id.* Thus, an assessor will often have knowledge of a property's sale prior to the time he assesses a property.

[6] Stratification is a method of weighting various sub-groups within a sample to ensure proper representation. Dr. Richards' stratified the sold properties into (1) improved properties, (2) vacant, not new properties, (3) vacant, new properties, and (4) non-rail utility properties. Tr. Vol. I, pp. 57-58.

standard non-parametric[7] statistical analysis. Plaintiff's Exhibit #2 at 3. Quite simply, the procedure tests whether two characteristics are independent of one another. Dr. Richards' Chi-square analysis tested whether the property type (sold or unsold) is independent from the change in assessment (decrease, no change, and increase). *Id.* If sold and unsold properties were treated equally in terms of change in assessment, then these characteristics would be independent and the distribution of sold and unsold properties would be the same over the three categories of change in assessment. *Id.* at 3-4.

In performing his Chi-square test, Dr. Richards first eliminated "new properties," "demolitions," and "obviously changed" properties from his analysis because the assessments of these properties would necessarily change for reasons other than sales chasing. Tr. Vol. I, pp. 66. Then, he examined each of the remaining properties to determine whether its assessment changed between tax year 1999 and tax year 2000 and categorized the properties into three groups: (1) properties that experienced a decrease in assessment, (2) properties with no change in assessment, and (3) properties that experienced an increase in assessment. Tr. Vol. I, pp. 67-68. Finally, Dr. Richards sorted each of the categorized properties into sold and unsold properties. Included in his definition of unsold properties are properties sold in transactions coded invalid by county assessors.[8]

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[7] In "nonparametric" statistics no assumptions are made about the population parameters.

[8] West Virginia's county assessors are charged with the duty of assigning a numerical code to the sale of every piece of commercial property in their respective counties. The codes, which were developed by the State Tax Department, describe particular factual situations from which it may be inferred whether or not the sale was a valid arm's length transaction. A property coded invalid is a property sold in what the assessor determined was not an arm's length transaction.

Tr. Vol. 1, pp. 73. The framework for recording this data would look like this:

	Decreased	No Change	Increased	Total
Unsold				
Sold				
Total				

Dr. Richard's Chi-square analysis demonstrated that property type (sold or unsold) was not independent of the change in assessment. Plaintiff's Exhibit #2 at 5-6. The assessments of sold properties experienced a much higher rate of change than the assessments of unsold properties. *Id.* A slightly greater proportion of the sold properties experienced a decrease in assessment than the unsold properties; a much smaller proportion of the sold properties experienced no change in assessment than the unsold properties; and a far greater proportion (more than twice the percentage) of the sold properties experienced an increase in assessment. Tr. Vol.1, pp. 69-70, Plaintiff's Exhibit #2, Figure 1. Thus, Dr. Richards concluded that using the sold properties as an indicator or sample of the entire population would significantly overstate the number of increases in assessments. Tr. Vol.1, pp. 74. To create a sample of sales that would accurately represent the entire population, Dr. Richards decided that he needed to revert some of sold the properties back to their 1999 assessments. *Id.* Specifically, he decided to revert two of the assessments that had experienced a decrease and seventy-seven of those that had experienced an increase.[9] Tr. Vol.1, pp. 77.

[9] These reversion numbers are the numbers Dr. Richards arrived at after analyzing the properties in the original database. The court chooses to use these numbers to explicate Dr. Richards' methodology, rather than the numbers from the stipulated database, because the testimony as to these numbers was more clear and the difference between the old and new numbers is small. The stipulated database should ultimately be used to calculate the number of reversions necessary.

Dr. Richards chose to revert the two sales that had experienced the largest percentage decrease in their assessment and the seventy-seven sales that had experienced the largest percentage increase. Tr. Vol.1, pp. 80. According to Dr. Richards, correcting for sales chasing requires the selection of properties with the greatest percentage change in assessment because the greater the percentage change, the greater the likelihood that change resulted from sales chasing. *Id.* After preparing his initial report reverting only those properties that experienced the greatest percentage change in assessment, Dr. Richards performed two Mann-Whitney tests. Plaintiff's Exhibit #4 at 9-10. A Mann-Whitney test is a non-parametric test of a hypothesis that two populations are identical. Plaintiff's Exhibit #4 at 9. Dr. Richards relies on his Mann-Whitney tests to support his assumption that sold properties experienced a greater magnitude of change in assessment than unsold properties. Tr. Vol. II, pp. 28.

In his first Mann-Whitney test, Dr. Richards challenged the hypothesis that the populations of sold and unsold properties were identical in terms of magnitude of change in assessment.[10] Plaintiff's Exhibit #4 at 9. To this end, Dr. Richards calculated the magnitude of change in assessment (meaning the percentage increase) for each property in both populations, and then he compared the two populations. *Id.* The results of this comparison suggest that there is a difference between the magnitude of change in assessment experienced by sold properties in the tax year 2000 and the magnitude of change in assessment experienced by unsold properties.

Dr. Richards claims to have used the second Mann-Whitney test as a check on his work, to see if - by selecting for reversion those properties that experienced the greatest magnitude of change

[10] "New" and "obviously changed" parcels were deleted from both populations. Plaintiff's Exhibit #4 at 9.

in assessment - he successfully corrected the inequality between the two populations. Tr. Vol. II, pp. 28-29. In this second test, he compared the population of unsold properties to the population of sold properties after his reversions and concluded that the reversion had reduced or eliminated the differential treatment between the two populations. If the opinion of Dr. Richards is accepted, then the level of assessment for all other commercial and industrial property, including public service company property, is 51.4% for the tax year 2000. Docket 89 - Plaintiff CSX Transportation, Inc.'s Post Trial Statement of Undisputed Facts at 5.

(D) The Board's Statistical Methodology

Like Dr. Richards, the Board's expert, Dr. James McClave, obtained a copy of the 2000 commercial and industrial tax role for West Virginia, prepared his own sales ratio study based on that data, and then adjusted his study to the database agreed upon by the parties.[11] Tr. Vol. I, pp. 130, 143. Again, like Dr. Richards, Dr. McClave performed a Chi-square analysis and determined that West Virginia assessors had engaged in sales chasing during the tax year 2000. Tr. Vol. I, pp. 131. According to Dr. McClave, to eliminate the effects of sales chasing and make the population of sold properties identical to the unsold properties, seventy-eight of the increased assessments would need to be reverted and two of the decreased assessments would need to be reverted.[12] Tr. Vol. I, pp. 134. The slight difference between number of reversions deemed necessary by Dr. McClave and the

[11] Dr. McClave used different stratifications than Dr. Richards. The stratifications employed by Dr. McClave were (1) vacant, improved, and new properties, and (2) properties that had above median assessment values and properties that had below median assessment values. Tr. Vol. I, pp. 139-41.

[12] The number of required reversions testified to by Dr. McClave was based on the old database of properties, rather than the stipulated database. Again, the difference is small, but the stipulated database should ultimately be used to calculate the number of reversions.

number of reversions deemed necessary by Dr. Richards' can be accounted for by the fact that Dr. McClave chose to exclude from his study sold properties coded invalid by the assessor. *Id.*

In addition, Dr. McClave performed a "neighborhood analysis" based on the neighborhood classifications provided by West Virginia assessors. Plaintiff's Exhibit #4, Appendix B. In this analysis, Dr. McClave compared (1) the percentage of properties with assessment increases in neighborhoods with sold properties that have, in total, positive assessment changes to (2) the percentage of properties with assessment increases in neighborhoods with no sales, or with sold properties that have, in total, non-positive assessment changes. *Id.* The results of his analysis demonstrated that neighborhoods with "positive sales" are significantly more likely to contain unsold properties with increases in assessment, thus indicating that assessors are more likely to increase assessments of unsold properties in neighborhoods where they have increased the assessments of sold properties. *Id.*

Dr. McClave selected his reversions using a statistical methodology called "bootstrapping." Tr. Vol. I, pp. 145. Bootstrap methodology is based on re-sampling. More specifically, the methodology involves the selection of repeated random sub-samples for reversion from the sample of sold properties. Plaintiff's Exhibit #4, Appendix B. Using this technique, Dr. McClave randomly selected properties to revert, calculated the median ratio of the randomly selected properties, repeated this process 10,000 times, and then selected the median of the 10,000 iterations as the most reliable statistical representative of the sales ratio. *Id.* Dr. McClave applied this bootstrapping technique using four methods and two stratifications, obtaining a total of eight median ratios.[13] Tr. Vol. I, pp.

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[13] Specifically, Dr. McClave applied the bootstrapping technique twice, using his two stratifications (vacant/improved/ new properties and properties that had above/below median

(continued...)

142. These eight ratios demonstrated statistical robustness, meaning that all results were closely clustered together. Tr. Vol. I. pp. 143. Dr. McClave's final ratio is based on the median of the eight median ratios arrived at through his randomization process. Tr. Vol. I., pp. 142. If the opinion of Dr. McClave is accepted, then the level of assessment for all other commercial and industrial property, including public service company property, is 56.1% for the tax year 2000. Docket 91 - Board of Public Works Argument in Favor of the Level of Assessment Testified to by Dr. James McClave at 4.

II. Discussion

The primary distinction between Dr. Richards' and Dr. McClave's methodologies is how each selected properties for reversion. While Dr. Richards' selected properties to revert based on the magnitude of change in assessment, Dr McClave's selections were determined through a randomization process. CSXT bears the burden of proving the accuracy of Dr. Richards' analysis by a preponderance of the evidence. In support of Dr. Richards' decision to revert only those properties with the greatest magnitude in change of assessment, CSXT advances two arguments. First, CSXT argues that sales chasing, by definition, only occurs when the magnitude of change in assessment is relatively high, and second, CSXT asserts that Dr. Richards' Mann-Whitney tests

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[13](...continued)
assessment values), to each of the following four reversion methodologies: (1) reversion of all sold parcels to identicality with unsold parcels, (2) reversion of all sold parcels to statistical non-significance with unsold parcels, (3) reversion of sold properties in neighborhoods that have sales with positive assessment changes to identicality with unsold parcels in the same neighborhoods, and (4) reversion of sold properties in neighborhoods that have sales with positive assessment changes to statistical non-significance with unsold parcels in the same neighborhoods. Plaintiff's Exhibit #4, Appendix B.

prove the necessity of reverting sales that experience a high magnitude of percentage change in assessment.

(A) Definition of Sales Chasing

According to CSXT, "[s]electing an appropriate statistical method to correct for the effects of sales chasing is entirely dependant on applying the correct definition of sales chasing." Docket 90 - Post Trial Brief of Plaintiff CSX Transportation, Inc. at 1. The plaintiff's expert employed a definition of sales chasing stipulated to by the parties: the practice of "selectively reappraising properties that sold during the tax year at or near the sales price, while not similarly reappraising properties that did not sell during the tax year." *Id.* The plaintiff notes that this definition is consistent with the following definition of sales chasing used by the International Association of Assessing Officers (IAAO): "the practice of using the sale of a property to trigger a reappraisal of that property at or near the sales price." *Id.* The plaintiff argues that, because this definition includes the term "at or near the sales price," the definition requires the court to adopt a statistical methodology that takes into account the magnitude of change in assessment. *Id.* at 2. The court disagrees.

To start, the term "at or near the sales price" implies nothing about the magnitude of change in assessment. Rather, this term reflects the fact that when a property is sold and the property's true and actual value becomes known to the assessor, the assessor is likely to change the assessment to something near 60% of the sales price because West Virginia law requires all non-exempt property to be assessed at 60% of its true and actual value. This fact, however, says nothing about the magnitude of that change. The magnitude of any change in assessment to 60% of true and actual

value depends entirely upon the property's prior assessment, and thus CSXT's argument that this language supports its consideration of magnitude rests on the assumption that a sold property's prior assessment is likely much lower or much higher than 60% of its true and actual value. The plaintiff has failed to offer any evidence to this effect, and therefore the court declines to adopt the plaintiff's argument that the stipulated definition of sales chasing says something about the magnitude of change in assessment.

Even if the court were to find the term "at or near the sales price" to be of consequence, Dr. Richard's did not select properties to revert based on whether the properties had been reassessed at 60% of their true value. Dr. Richards selected the properties that had experienced the greatest magnitude of change in assessment. As a result of this exclusive focus on magnitude, the reversions selected by Dr. Richards included properties whose assessments were changed to something other than 60% of the market value and excluded sold properties whose assessments were in fact changed to something at or near 60% of market value.[14]

The task before the court is not to determine the definition of the phrase "sales chasing," or to eliminate the effects of "sales chasing" as this practice is defined by the parties' stipulations. Rather, the court's role is to decide which statistical method of analysis ensures that the sold

[14] For example, Dr. Richards chose to revert County 20, parcel number 187009, which sold in May 1999 for $500,000. The 1999 assessment of parcel number 187009 was $127,000 (25% of the true value), and the 2000 assessment was $166,620 (33% of the true value). Tr. Vol. II. pp. 46-47. He selected this sale for reversion because it experienced a high magnitude of change, even though the change did not fit the "at or near the sales price" definition he claimed to use. Conversely, Dr. Richards did not revert County 06, parcel number 0530388, which sold for $55,000 in June 1999. This parcel's assessment changed from $30,720 (56% of true value) in 1999 to $33,240 (60% of true value) in 2000. *Id.* at 48. Although this change in assessment clearly fits the "at or near the sales price" definition, the magnitude of change was not sufficient to meet Dr. Richards' criteria for reversion.

properties used in the sales ratio study accurately represent all commercial and industrial property in West Virginia. Therefore, sales chasing need only be considered to the extent necessary to ensure that sold properties are an accurate representation of all other properties. Bearing this in mind, the court finds Dr. McClave's view of sales chasing to be the most helpful. According to Dr. McClave, "from a statistician's point of view [sales chasing] means a greater probability that a sold property will be changed either positively or negatively in its assessment than an unsold property." Tr. Vol. 1, pp. 130-31. This seems to cut directly to the core issue in this case. Assessors have specific information about the market value of sold properties, and this information makes it more likely that an assessor will change the assessment of sold property. Thus, for the sold properties to accurately represent all properties, the data must be adjusted to account for the difference in treatment resulting assessors' increased information about the value of sold properties.

(B) Statistical Analysis

Section 306 has resulted in near continuous litigation between railroads and state governments in general and CSXT and the Board in particular. The "broad range of data and circumstances" affecting each year's sales assessment ratio study precludes the adoption of a single rule for determining the ratio of assessed to market value in every case. *CSXT II*, 95 F.3d at 322. It is clear, however that "Congress expected courts to determine states' assessment levels for other commercial and industrial property by applying sound statistical principles to random samples." *Id.* Thus, in analyzing each statistical methodology employed by the parties in this case, the court must consider whether the methodology comports with generally accepted principles of statistics and whether the methodology properly uses random samples to determine the sales ratio. CSXT bears

the burden of proving by a preponderance of the evidence that the statistical methodology propounded by its expert, Dr. Richards, is both analytically sound and more accurate than Dr. McClave's methodology. Having carefully reviewed the evidence submitted by both parties, the court concludes that CSXT failed to meet this burden.

A review of Dr. Richards' testimony and reports suggests that his analysis was not based on sound principles of statistics. To start, Dr. Richards' Chi-square analysis is inconsistent with his decision to revert only those properties that experienced the greatest magnitude of percentage change in assessment. Dr. Richards used the Chi-square analysis to determine how many reversions were necessary to make the number of changes in assessment experienced by the population of sold properties equivalent to the number of changes experienced by the unsold properties. In his Chi-square analysis, every change in assessment mattered, no matter how large or how small. That is, Dr. Richards used every change in assessment to determine the number of reversions necessary to equalize the number of changes in assessment occurring in the sold and unsold properties. When selecting properties for reversion, however, Dr. Richards essentially decided to ignore those sales that experienced a small magnitude of change because he didn't "see a minor change in the assessment and a minor movement of the ratio . . . as being potentially chased." Tr. Vol. I, pp. 81. If Dr. Richards did not consider small changes in assessment as relevant to the sales chasing issue, then he should not have used these small changes to calculate the number of reversions necessary. By changing the focus of his calculations from all changes in assessment to large changes in assessment midway through his process, Dr. Richards ended up reverting the most extreme set of properties, meaning he reverted the maximum number of properties and the properties he reverted were those that had experienced the greatest magnitude of change.

Dr. Richards bases his decision to revert only those properties that experienced the greatest magnitude of change on his assumption that these properties are more likely to have been sales chased. Plaintiff's Exhibit #2 at 11. In other words, he assumes that if a sold property experiences a greater magnitude of change in assessment, it is more likely that the assessor changed the assessment because of the sale and not for some other reason. Therefore, he reasons that to make sold properties an accurate representation of unsold properties, the properties selected for reversion must be the properties with the greatest percentage change in assessment. Dr. Richards and CSXT, however, have failed to present the court with any independent support for the non-statistical assumption that a high magnitude of change in assessment indicates sales chasing, and in the absence of such support, CSXT cannot prove its case by a preponderance of the evidence.

Chi-square analysis does not identify which properties were sales chased or reveal which properties should be reverted to make the population of sold properties identical to the population of unsold properties. Tr. Vol. I, pp. 110. To correct the differential treatment of unsold properties identified by his Chi-square analysis, Dr. Richards could have reverted any set of sold properties, so long as he made the correct number of reversions. Dr. Richards relies on the Mann-Whitney tests outlined in his rebuttal report to prove that the magnitude of change in assessment for sold properties greatly exceeds the magnitude of change for unsold properties.[15] Having reviewed Dr. Richards' first Mann-Whitney test, the court concludes that this test does in fact suggest that there is a difference between sold and unsold properties in terms of magnitude of change in assessment. Neither of the

[15] Dr. Richards did not prepare the Mann-Whitney tests until after he had already reverted those properties with the greatest percentage change in assessment. While the timing of these tests is not dispositive of their value, it does reveal that Dr. Richards was predisposed to find a relationship between sold properties and the magnitude of change in assessment.

Mann-Whitney tests, however, suggest that correcting for this difference in magnitude requires the reversion of the maximum possible number of properties with the greatest magnitude of change.

The mere existence of a difference in magnitude of assessment does not necessitate the selection of the most extreme set of properties for reversion. Logically, a random reversion of sold properties would also correct for a difference in magnitude. Dr. Richards seems to have identified a possible problem with the sales ratio study and to have simply guessed at how the data could be manipulated to correct for the problem. His guess is not supported by any empirical evidence or principles of statistics. Further, given that Dr. Richards hand-selected his data prior to performing the second Mann-Whitney test, the court declines to view this second test as a check on his manipulation. A statistician is not absolutely free to choose his own data. Statistics is the scientific measure of probabilities and possibilities, and as such, it requires the expert to apply sound principles to the given data.

Further, the court is hesitant to rely on Dr. Richards' testimony in this case because he has made a contrary assertion in an earlier case. At the hearing, Dr. Richards testified that he analyzed West Virginia's sales assessment ratio study for tax year 1996, and the court has examined an affidavit from Dr. Richards filed in the now-settled tax year 1996 case. *See* Defendant's Exhibit #1. Dr. Richards' statement in the affidavit made clear that the sales chasing issue in the 1996 case was a smaller version of the sales chasing issue in the present case. In 1996, Dr. Richards discovered sales chasing in a sub-group of properties, *vacant* sold commercial and industrial properties, and adjusted the data to correct for the sales chasing. He did not, at that time, choose to revert the properties with the highest percentage increase in assessment. Tr. Vol. I, pp. 123. Instead, he adjusted for the sales chasing by using a random sampling methodology. *Id.* Dr. Richards' use of

random sampling in the 1996 case appears to be at odds with his decision to hand-select properties for reversion in this case.

The purpose of using statistical tests is to eliminate guesswork and to give inductive logic a mathematical footing. This means that statistical tests must remain completely objective, and the choices made by a statistician in constructing a test must be supported by some evidence or data. There is no evidence or data to support CSXT's assumption that to correct for sales chasing, those properties selected for reversion must be the properties with the greatest percentage change in assessment. Chi-square analysis determines the number of sales to revert, but leaves no information about which sales should be reverted to make the two populations identical. Tr. Vol. I, pp. 136. "[T]he most appropriate statistical decision we can make at that point, given our lack of knowledge about which sales were chased, is to find the average by doing some sort of very large random sampling or bootstrapping procedure." Tr. Vol II, pp. 54. In other words, given that the only information we have is the number of reversions necessary to equalize the number of changes in assessment between the two populations, the most objective and statistically sound method of selecting properties for reversion is random selection.

The Board's expert, Dr. McClave, determined the number of reversions necessary using a Chi-square test and then randomly selected the properties to revert. Dr. McClave's randomization process was based on a bootstrapping technique generally accepted in statistics, in which he determined the median sales ratio of all properties after each set of reversions, and performed 10,000 iterations of this process, and then selected the median sales ratio of the 10,000 iterations. Further, Dr. McClave applied this bootstrapping technique using four methodologies and two stratifications in order to test the sensitivity of the result. The results he obtained were tightly "clustered" or

"robust," demonstrating the accuracy of his work. In short, the Board's ratio is based on sound principles of statistics and the proper use of random samples.

CSXT failed to meet its burden of proving the soundness and accuracy of its methodology, as compared to that of the Board, by a preponderance of the evidence. Therefore, the court **FINDS** that the statistical methodology used by Dr. McClave to fix the ratio of assessment to true market value for commercial and industrial property in West Virginia for tax year 2000 is superior to the methodology employed by Dr. Richards.

(C) Public Service Company Property

The term "all other commercial and industrial property" as used in Section 306 includes both locally assessed and centrally assessed properties. *Clinchfield RR Co. v. Lynch*, 700 F.2d 126, 130 n.5 (4th Cir. 1983). Consequently, both locally and centrally assessed properties must be considered when determining whether the taxation of railroads is discriminatory as compared to other commercial and industrial property. *See id.* The state's sales ratio study includes only locally assessed properties. Public service company property (utility property), which is centrally assessed by the Board, is excluded. W. Va. Code § 11-6-11. The parties agree that the sales ratio study used to measure discrimination must be adjusted to reflect the value of utility property, but disagree about how the utility property should be ingested.

Dr. Richards ingests utility property by using the number of utility units. Like most states, West Virginia appraises railroads and other utilities or public service companies utilizing a "unit" or "system" valuation; all of a public service company's property wherever located throughout its entire operating system is appraised as a single operating unit. Docket 89 - Plaintiff CSX

Transportation, Inc.'s Post-Trial Statements of Undisputed Facts. Dr. Richards assumed that each of the 418 non-transportation public service company units in West Virginia was assessed at 60% of true market value, as required by the statute and included those 418 units in his median calculation. Tr. Vol. 1, pp. 102. Comparatively, Dr. McClave ingested the utility property as public utility parcels of land, which resulted in the inclusion of approximately three thousand parcels at 60% of market value. Tr. Vol. I, pp. 106. According to Dr. McClave, this is the proper way to treat utility property because everything else in the database is listed according to parcel.

The method of ingestion selected will have a relatively minor effect on the sales ratio used to determine the level of discrimination in this case. As noted above, in a sales ratio study, a ratio is determined for each property in the sample, and then the median ratio of all properties in the sample is used to represent the sales ratio for all properties in the taxing jurisdiction. Including a large number of individual public service company ratios at 60/100 draws the median toward this number. Thus, ingesting the public service company property by unit minimizes the effect of public service company properties on the median by lowering the number of such ratios used to calculate the median. Conversely, ingesting public service company properties by parcel increases the effect on the median. The numerical difference between Dr. Richards' utility ingestion method and Dr. McClave's is less than one percentage point. Tr. Vol. I, pp. 108.

Congress enacted Section 306 as a remedial measure, intended to correct the discriminatory manner in which states taxed railroad property. *See Clichfield*, 700 F.2d at 129 n. 1, 2. By specifying that the sales assessment ratio study should be used to measure discrimination under Section 306, Congress expressed its intent to use a measurement that makes the fairest possible comparison between the railroad and the average taxpayer. *Id.* at 130 n. 5 (citing S. Rep. No. 1483,

90th Cong., 2d Sess. 23 (1968)). The assessment process for public service corporations differs from that of all other commercial and industrial taxpayers. Nevertheless, given that public service corporation property must somehow be included in the category of commercial and industrial property, it should be treated as much like other property as possible. The sales ratio for all other commercial and industrial property is calculated by the parcel. The court, therefore, adopts Dr. McClave's methodology and **FINDS** that public service corporation property must be ingested into the sales ratio study by the parcel.

III. Conclusion

The court **FINDS** that the level of assessment of non-railroad commercial and industrial property in West Virginia was properly calculated by the Board's expert, Dr. McClave, as being 56.1% for the tax year 2000. The level of assessment for CSXT's property exceeded the level of assessment for other commercial and industrial property by more than 5%, and thus CSXT has met its burden of proving that the Board's tax assessment for tax year 2000 is discriminatory under Section 306.

Pursuant to 28 U.S.C. § 2201, the court enters declaratory judgement that the portion of the Board's assessment of CSXT's rail transportation property in the state of West Virginia for the tax year 2000 in excess of 56.1% of its true market value violates Section 306. To date, CSXT has paid taxes on 50% of the tax year 2000 true market value of its rail transportation property in West Virginia. The court orders CSXT to pay the State Auditor an amount equaling the taxes owed for the tax year 2000 based on an assessment of its property at 56.1% of true value plus interest running from April 1, 2001. The Board is hereby permanently enjoined from assessing CSXT's rail

transportation property in West Virginia for the tax year 2000 at any level in excess of 56.1% of its true market value. In addition, the court enjoins the levy or collection of any tax based on a tax year 2000 assessment in excess of 56.1% of the true market value of CSXT's property in West Virginia. The Board is further directed to notify the appropriate county officials of this court's ruling.

The court **DIRECTS** the Clerk to send a copy of this Order to counsel of record and any unrepresented party, and **DIRECTS** the Clerk to post this published opinion at http://wvsd.uscourts.gov.

ENTER: April 8, 2004

_____
JOSEPH R. GOODWIN
UNITED STATES DISTRICT JUDGE

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